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6804/103649 

INVESTOR IN PEOPLE

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

11 OCT 2004

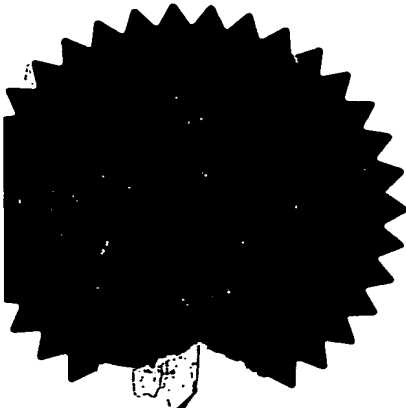
I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

I also certify that the attached copy of the request for grant of a Patent (Form 1/77) bears an amendment, effected by this office, following a request by the applicant and agreed to by the Comptroller-General.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

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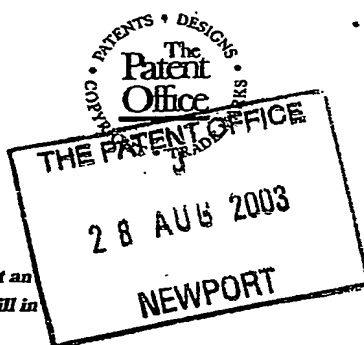
Signed

W. Evans

Dated 30 September 2004

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P01/7700 0.00-0320148.0

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference RML (PARTIAL COATING)

2. Patent application number 0320148.0
(The Patent Office will fill in this part) 12 8 AUG 2003

3. Full name, address and postcode of the or of each applicant (underline all surnames) DORMER TOOLS (SHEFFIELD) LTD
SHIREOAKS ROAD
WORKSOP
S80 3HB

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

7701029002
GREAT BRITAIN

4. Title of the invention PARTIALLY COATED DRILL TOOL

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

DORMER TOOLS (SHEFFIELD) LTD
SHIREOAKS ROAD
WORKSOP
S80 3HB
F.A.O. MR. R. LILL
Monburn Ellis LLP
York House
23 Kingsway
London
WC2B 6NP

Patents ADP number (if you know it)

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if
a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

YES

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Patents Form 1/77

Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description

2

Claim(s)

1

Abstract

Drawing(s)

2 x 2

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11. TO BE SIGNED FOR & ON BEHALF OF DORMER TOOLS (SHEFFIELD) LTD
COMPANY SECRETARY

I/We request the grant of a patent on the basis of this application.

Signature

[Signature]

Date

27/8/03

12. Name and daytime telephone number of person to contact in the United Kingdom


MR. R. LILL 01909 534786

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

- If you need help to fill in this form or you have any questions, please contact the Patent Office on 08459 500505.
- Write your answers in capital letters using black ink or you may type them.
- If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- If you have answered 'Yes' Patents Form 7/77 will need to be filed.
- Once you have filled in the form you must remember to sign and date it.
- For details of the fee and ways to pay please contact the Patent Office.



Draft patent specification

Title: Partially coated drill tool

Inventor: Vijitha Maithri Weerasinghe

Address: 4 Kinlet Road
London SE18 3BY
United Kingdom

Nationality: British

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The invention entitled 'partially coated drill tool' is concerned with a method to inhibit the detrimental transfer of coating material into the surface of a drilled hole. By way of example, the application of the method is described considering a high-speed steel twist drill.

It is known that coating a twist drill with a hard material such as titanium nitride greatly enhances the drill performance in terms of drill life and drilling speed. The coating thickness is typically of the order of 4 microns and is normally applied to the whole flute length of the drill.

During the drilling process, fragments of the hard coating from the twist drill have been shown to get embedded on the surface of the drilled hole wall, see Fig.1. The embedded fragments act as stress raisers and this is of particular concern where fatigue of the component being machined is a consideration.

The above problem has inhibited the use of coated twist drill particularly in the aircraft industry for applications where component fatigue is a consideration. It has been observed that the transfer of the coating fragments takes place mainly from the drill margin lands, which are in continuous contact with the walls of the hole during drilling.

Claims:

- (1) A twist drill in which a hard wear resistant coating is applied to preferred surfaces
- (2) According to claim (1), where the preferred surfaces are the rake faces
- (3) According to claim (1), where the preferred surfaces are the rake faces and the flanks.

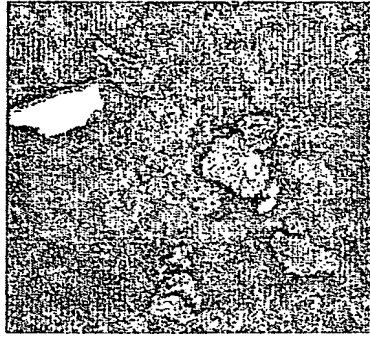


Fig.1 A SEM picture showing fragments of the drill coating embedded on the surface of a drilled hole surface. Particle size $\sim 10\mu\text{m}$.

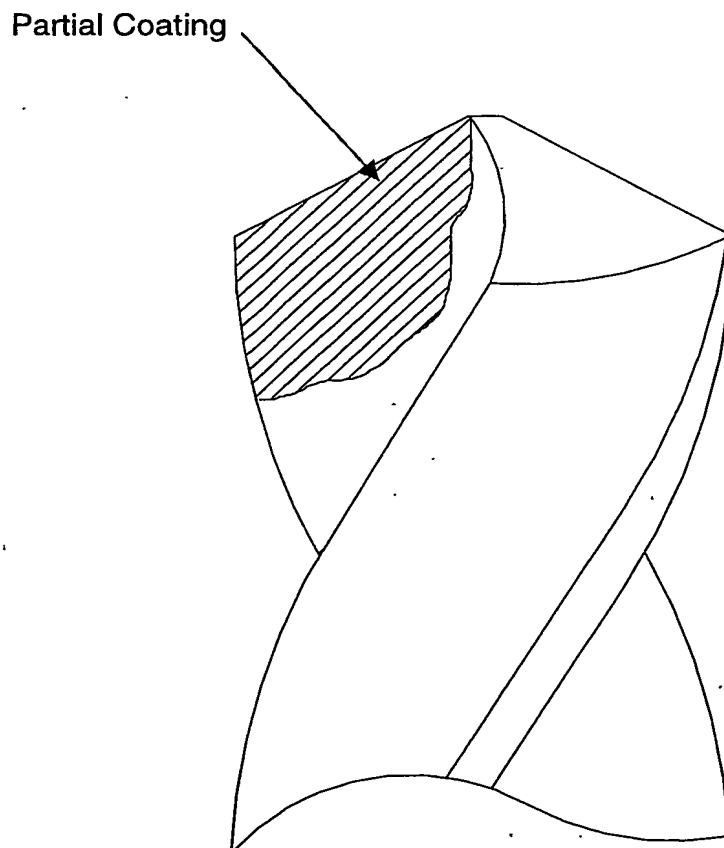


Fig. 2 A partially coated drill tool. The coating is applied only to the rake face.

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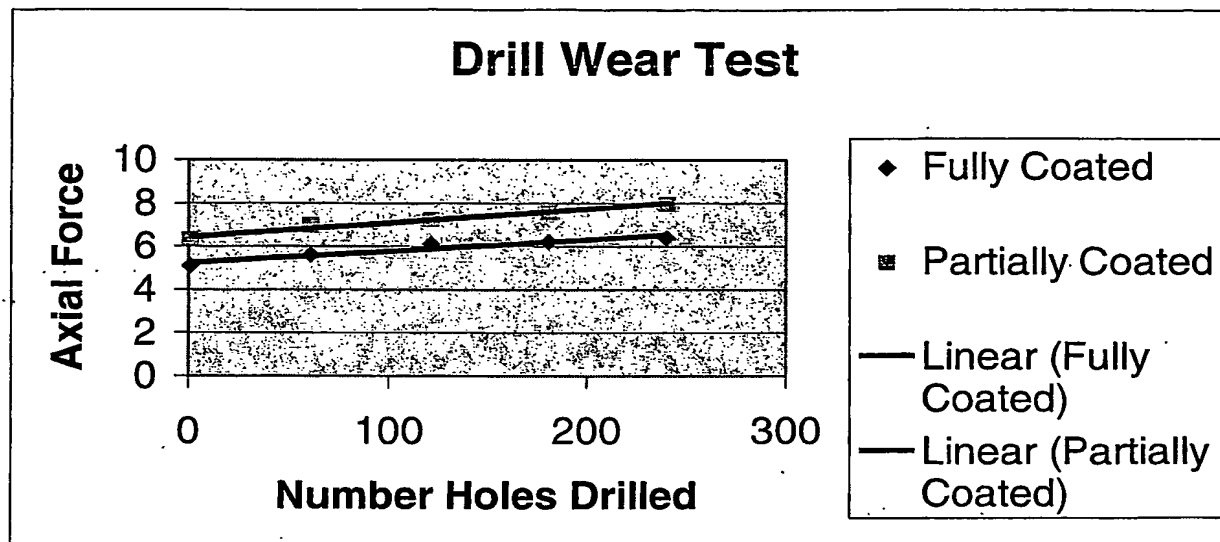


Fig. 3 Comparison of drill wear between fully and partially coated drill tools

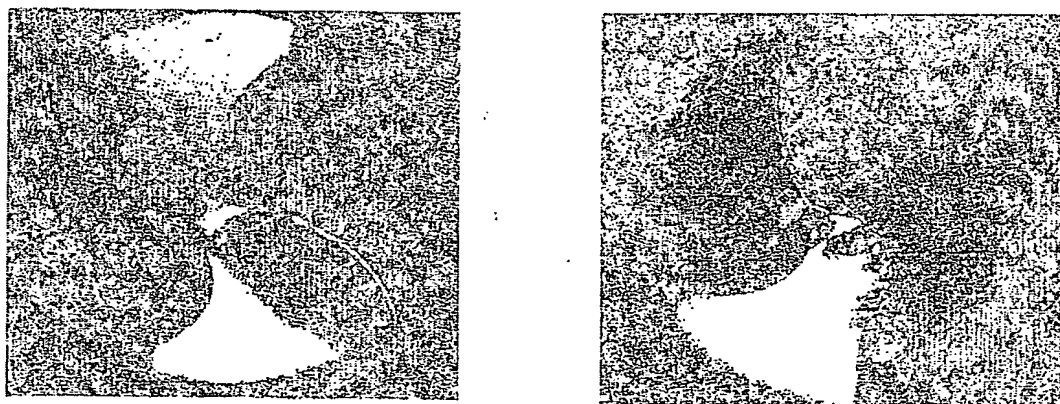


Fig.4 Shows marginal difference of wear on drill points of a partially coated drill tool (Left) and a fully coated drill tool after drilling 240 holes each.